

The relationship between state funding and volunteer levels in voluntary sector organisations: a quantitative analysis of regulatory data

DAMM, Christopher <<http://orcid.org/0000-0002-7355-3496>>

Available from Sheffield Hallam University Research Archive (SHURA) at:

<http://shura.shu.ac.uk/25571/>

This document is the author deposited version. You are advised to consult the publisher's version if you wish to cite from it.

Published version

DAMM, Christopher (2019). The relationship between state funding and volunteer levels in voluntary sector organisations: a quantitative analysis of regulatory data. Voluntary Sector Review.

Copyright and re-use policy

See <http://shura.shu.ac.uk/information.html>

The relationship between state funding and volunteer levels in voluntary sector organisations: A quantitative analysis of regulatory data.

Author: Christopher Damm (Centre for Regional Economic and Social Research, Sheffield Hallam University)

Acknowledgements: The research presented in this paper draws from my PhD in Social Policy, completed at and funded by the School of Social Policy at the University of Birmingham. Thank you to Pete Alcock and James Rees, my supervisors, as well as the school itself for funding the PhD. Thanks are also due to all the members and former members of the Third Sector Research Centre (TSRC) for their support, to TSRC and NCVO for making available the charity accounts dataset used for this study, and to David Kane for making available the ICNPO classifications used. Thank you also to Chris Dayson and Paul Lawless for helpful comments on an earlier version of this paper.

Conflict of Interest: The author declares that they have no conflict of interest.

Abstract: There is a long-standing debate within voluntary sector studies concerning the relationship between state funding and volunteer levels within voluntary sector organisations (VSOs). Due to a lack of suitable data, this debate has previously suffered from a lack of aggregate, quantitative evidence at the sector level. This article helps to fill this gap by exploring the relationship amongst larger charities in England and Wales (annual income over £500,000), using a relatively new regulatory dataset on charity funding sources. The findings reveal a complicated relationship, with some small to moderate associations between the key variables. Amongst VSOs with at least some state funding, state income is correlated with

smaller proportions of volunteers, even after controlling for size and industry.

However, those with no state funding at all appear less likely to use volunteers, and to use them in lower average numbers, than those with at least some state income.

Key words: State income, service delivery, contracts, volunteers

Word Count: 7,944

Introduction

There is a prominent and international debate on the impact of state funded service contracts on the role of volunteers in VSOs (Scott and Russell, 2001; Billis and Harris, 1992; Simmons and Emanuele, 2004). Rochester (2014) acknowledges a somewhat limited evidence base, but suggests that state funding may have instigated a "*trend towards fewer volunteers (whether in absolute terms or as a proportion of the voluntary sector workforce)*" (p.4). He raises concerns that individuals, particularly from socially excluded groups, may find fewer opportunities for empowering, developmental, or emancipatory volunteering. VSOs and wider society may consequently lose volunteers' flexible and personal contribution to services, their democratic input via campaigning and advocacy, and associated gains in social capital (Salamon et al., 2003; PASC, 2008).

Given huge increases in funding to the UK voluntary sector from the state over the previous two decades (NCVO, 2017), such changes could potentially have had a profound impact across the voluntary sector. Despite a body of case study research (Alcock et al. 2004; Chater, 2008), however, there is little evidence with which to assess how strong or widespread the relationship between state income and volunteers might be at the sector level. This paper, therefore, addresses the following research question:

- *What is the relationship between state income and volunteer levels in VSOs across the voluntary sector?*

To do so, the paper uses an existing dataset on the funding sources of English and Welsh charities, developed from their organisational accounts. A major reason for the lack of previous quantitative research on this topic at the sector level has been a lack of data, which this relatively new data source helps to address. The analysis explores the relationship

between state funding and volunteer levels using a number of measures, along with some important covariates.

The findings suggest that the overall picture is complex, but that there are some small to moderate associations between the key variables in both directions, depending on the measure used and which sub-section of charities is explored. The findings suggest, therefore, that a nuanced interpretation of the relationship is needed. The results also show the clear merits of the charity accounts dataset for exploring this relationship. In particular, there is a strong justification for further longitudinal research as more data becomes available, to assess how these relationships develop over time and to better account for potentially unobserved covariates.

Literature review

The relationship between the voluntary sector and the state

This research is primarily concerned with voluntary sector delivery of welfare services, such as housing, employment support and social care (Alcock, 2008). Although this arguably neglects other forms of voluntary action, involvement in service delivery is the focal point of controversy over the voluntary sector's relationship with the state (Benson, 2014; Seddon, 2007). In the UK, concern over this relationship increased notably following the 1990 National Health Service and Community Care Act. This required local authorities to contract out social care services, such as domiciliary services for disabled people living in the community, to external providers (Taylor, 1996). As far back as 1993, Knight warned participation in this agenda risked "*lost directions, low morale and spoiled self-worth*" (p. xi). Similar debates have played out internationally, particularly in the US, where contracting has an even longer but equally controversial history (Smith and Lipsky, 1993; Kramer, 1994).

State funding and contracts to the voluntary sector subsequently ballooned across multiple service areas following the 1997 election of New Labour. The NCVO Civil Society Almanac (2017) suggests that state funding increased steeply from £10bn in the financial year 2000/2001 to £15.5bn in 2007/2008 (2014/2015 prices), before largely flattening out.

Concern grew that the sector and its activities had been rendered 'governable' and their advocacy and campaigning roles neutralised to create a pliant pool of contractors (Carmel and Harlock, 2008). The focus on outsourcing and 'Open Public Services' continued or even strengthened under subsequent Conservative led governments, but without New Labour's rhetoric around partnership and voluntary sector exceptionality (Dayson and Wells, 2013).

One of the main critiques of these large increases in state funding, especially via the medium of public service contracting, is that it poses a risk to the voluntarist aspects of voluntary sector, such as volunteering (Rochester, 2014). These concerns fit into wider debates and

concern over whether the voluntary sector is becoming increasingly 'professionalized' or 'managerialist', due to either state funding or market based competition (Maier et al. 2016; Geoghegan and Powell, 2006; Dart, 2004). Rochester (2013) warns that increasingly, external intervention from the state and a loss of independence for VSOs risks their distinctive, voluntary identity and hence their 'value' (p.10). If volunteering levels are reduced, there may be a risk of undermining what makes the voluntary sector '*special*' (Independence Panel, 2011, p.5), or even of jeopardising its "*soul*" (Billis and Harris, 1996, p.244). As Macmillan (2013) points out, claims about distinction and value are closely linked, and under the popular structural operational definition, voluntary input is the only criterion that defines the sector based on what it *is* rather than what it is *not* (Salamon and Anheier, 1997).

More practically, the voluntarism and independence of the voluntary sector are arguably what makes it a valuable space for innovation and democratic participation (Eikenberry, 2009). Many contributors to a Public Administration Select Committee report (PASC, 2008) argued that volunteers are valuable due to their commitment, informal flexibility and a more relational approach. This may be due to flat hierarchies and the suggested overlap between various stakeholder groups in VSOs, including users, former users, trustees, donors, volunteers and staff (Billis and Glennerster, 1998). In practice, some of these benefits are contested and difficult to evaluate (DiMaggio and Anheier, 1990; PASC, 2008). Salamon (1987) also famously suggested a purely voluntary welfare response might suffer from paternalism, amateurism, particularism and insufficient resources. Nevertheless, authors such as Billis (2010) strongly suggest that the less VSOs rely on volunteers, the less distinctive they become.

These concerns both reflect and support different visions on how the voluntary sector interacts with the state regarding welfare services. Young (2000) outlines a threefold model to describe different views on how the relationship between the state and voluntary either

does, or ought to operate. First, Young identifies a 'supplementary' view. Seddon (2007), for example, argued that voluntary action and state funding are inherently incompatible and favoured individuals taking collective, voluntary responsibility for their own welfare. Others such as the National Coalition of Independent Action (NCIA, 2013), argued that the state should take primary responsibility for welfare provision and VSOs provide only additional services that the "*government cannot, will not, or should not do*" (2015, p.1, Benson, 2014). The NCIA would also likely endorse what Young describes as an 'adversarial' view, which allows interaction with the state but via lobbying and advocacy. In contrast, 'The Panel on the Independence of the Voluntary Sector' (2015), favoured what Young would refer to as a 'complementary' view. They argued for a partnership-based approach to welfare services, under which the state provides funding but the rights and independence of voluntary organisations are protected.

The extent to which voluntary and state service provision can coexist has subsequent ramifications for what happens to volunteering levels when levels of state funding change. There is a wide ranging literature focused on whether increased state funding 'crowds out' the various actions of civil society (Bredtmann, 2016). The suggested mechanism is that individuals will see less need to contribute their own time to address the welfare needs of society if they feel that state funded services already meet that demand (Simmons and Emanuelle, 2004). Arguably, this assumes a fixed level of need for welfare services and a zero-sum division of labour between the sectors (Stadelmann-Steffen, 2011), perhaps reflecting a more 'supplementary' view of sector relations (Young, 2000; Dahlberg, 2005).

The impact of state funding on VSOs

A review by Bredtmann (2016), which also looked at individuals' financial donations, suggests that empirical findings on whether state funding crowds out voluntarism are mixed, though small crowding out effects do seem to be found more often than not. The variation

perhaps reflects the wide variety in study designs, operationalisation of state income and volunteering, and the level of analysis used. Rather than looking directly at the organisational level, many of the studies appear to be cross-national comparisons using aggregate figures (van Oorschot and Arts, 2005; Bartels et al. 2011). For example, Stadelmann-Steffen (2011) examines the relationship between OECD countries. Simmons and Emanuele (2004), in contrast, explore the relationship between state spending in individual survey respondents' local area, and their individual level of volunteering. Enjolras (2002) does look at volunteer participation at the organisational level, but at how it relates to 'commercial' rather than state income. Dahlberg (2005) also uses an organisational level sample, but explores the amount of voluntary services provision, rather than on volunteering directly.

There is, however, some theoretical justification to expect that volunteering and state income might be linked within individual VSOs. Theories of organisational change are often invoked to explain how the state might use its financial influence over the voluntary sector to shape it to its own needs or in its own image (Milbourne and Cushman, 2015; Milbourne, 2013; Rochester, 2013). Both coercive isomorphism (DiMaggio and Powell, 1983), and resource dependency (Pfeffer and Salancik, 1978) suggest that external funders are able to directly leverage concessions from recipients due to their dependency. Other forms of isomorphism, mimetic and normative, are more related to norms of legitimate behaviour (DiMaggio and Powell, 1983). They suggest that to seek or retain state funding, organisations must follow norms of the 'appropriate' behaviour for state contractors.

There is also qualitative case study evidence from the literature on contracting which seems to support these concerns. Chater (2008) found in several homelessness charities delivering state funded contracts that volunteers were marginalised or treated dismissively in favour of professionally qualified, specialist staff. Seddon (2007) also asserts that contracts marginalise volunteers. And Hedley and Davis Smith (1994) suggested from early survey

evidence that volunteers are included in contracts as an afterthought, if at all. Some case studies suggest that VSOs hire more staff to cope with the specialist and regulated work required for state contracts (Alcock et al., 2004), though this does not necessarily mean a reduction in volunteers (Geoghegan and Powell, 2006). The type of role that volunteers perform may shift, however. Frontline roles such as crisis intervention and dealing face-to-face with service users may be left to paid, professional staff, while volunteers take on administrative, governance or fundraising work (Alcock et al., 2004; Smith and Lipsky, 1993; Scott and Russel, 2001). This may risk losing the relational and informal approach some attribute to direct volunteer input into service delivery (PASC, 2008). It is plausible that at least some volunteers may become disillusioned as a result (Nichols et al., 2016).

What is less clear is whether these tensions, identified in case study research, are in fact leading to widespread challenges in volunteer retention and recruitment across all VSOs (Seippel, 2002; Rochester, 2014). While the crowding out literature suggests that there may be some relationship between total volunteering levels and overall state spending, particularly between states, this does not necessarily translate into what is happening within individual VSOs. In the UK case, survey evidence on volunteer motivations also casts some doubt on the idea that the increases in state funding are putting off volunteers in large numbers.

Reporting on the 2015/2016 Community Life Survey, NCVO (2017) found that by far the most common reason for stopping volunteering was a lack of time or a change in circumstances (52% of respondents). Displeasure with the type of activity offered (2%) or concerns over bureaucracy, risk and liability (2%), which might be more associated with state contracting, were amongst the least common reasons given.

Across the UK voluntary sector the number of staff *did* increase rapidly to 853,000 people in June 2016, up 37% from 2004 (NCVO, 2017; DCLG, 2011). NCVO estimate that the number of adults formally volunteering at least once a month has increased at a slower rate of

approximately 8% over a similar period, from 13.2 million in 2003 (2006) to 14.2 million in 2015/16 (2017). This suggests that the average staff to volunteer ratio has increased alongside growing state funding, though not necessarily whether these two variables are correlated across VSOs. A recognised scarcity of suitable organisational data has perhaps limited the ability of researchers to explore this relationship more directly (UKSA, 2012).

It is also unclear exactly how the potential relationship may be influenced by other factors, though we can draw on the state funding literature to suggest some potentially important variables. A wide range of researchers have identified organisational size as a moderating factor on state funding's influence (Buckingham, 2012; Morris, 2000; Chater, 2008).

Cunningham (2008) suggested that larger organisations can afford to be much more assertive with their funders. We also know that state funding levels, and the environmental pressures VSOs are exposed to, differ markedly between different service fields or 'industries' (Leiter, 2013). In industries where state contracting is more established and regulated, such as social care, the impact of state income on volunteer levels may be greater. A final potential moderator is the form the funding relationship takes (Buckingham, 2009). Many distinguish between grant funding, associated with unrestricted giving, and contracting, associated with tighter specification (Independence Panel, 2015). The distinction is arguably one of control. Grant funding allows VSOs to provide their own independent vision and maintain their "voluntary spirit" outside of the state orthodoxy, meaning the impact of grant funding on volunteers is potentially less strong (Smith and Lipsky, 1993, p.111; Benson, 2014).

Although this review suggests a shortage of directly applicable quantitative research at the sector-wide level, there is sufficient evidence and theory to suggest the following hypothesis in relation to the research question:

- *state income is negatively related to volunteer levels in VSOs across the voluntary sector as a whole.*

The following section outlines the methods and analysis used to test this proposition and explore in-depth the relationship between the two variables.

Methods

Data and sample

In order to test this proposition and explore the relationship in depth, this study took the Register of Charities for England and Wales as a starting point. This dataset contains financial and organisational characteristics drawn from charities' annual returns to the Charity Commission. There are service delivery organisations in the voluntary sector which are not charities, for example some Community Interest Companies. These organisations are less heavily regulated, but remain restricted in terms of how they can use or distribute their assets. Nevertheless, charities make up the majority of the sector, at least in terms of formally registered organisations (NCVO, 2018). UK charity law at least allows us to be confident that charities are not for-profit and ensures a reasonable amount of publically available data. Most registered charities with an income over £10,000 are expected to submit a return, and those with an income over £500,000 are expected to submit the additional, more detailed 'Part B' (Charity Commission, 2013). This latter group are referred to here as 'Part B charities'.

In common with the major UK sources of survey data for VSOs (Ipsos MORI, 2008, 2010), the main problem with the charity register as a research tool is the difficulty disaggregating income sources, including state income. Young et al. (2010, p. 167) described this as a *'problem that plagues researchers'* on both sides of the Atlantic. Partly to address this issue for England and Wales, the Third Sector Research Centre (TSRC), and the National Council of Voluntary Organisations (NCVO), began investing in a new dataset in 2010, built from information taken directly from charity accounts. Lines from a representative sample of charity accounts were digitalised by the Centre for Data Digitalisation and Analysis and then classified into income sources using a mixture of human and automatic methods (Kane et al. 2013). This data source therefore has the considerable advantage of being able to identify state income levels for all sizes of charity, as well as being linkable to the charity register. To

date; however, only a few univariate studies appear to have been published using the data (Clifford and Mohan, 2016; Mohan and McKay 2017; NCVO, 2017).

This 'accounts dataset' does not include any 'exempt' charities, such as universities, who do not need to register with the Charity Commission as they are regulated primarily by other bodies. Nor does it include 'excepted' charities who need not submit an annual return, which includes specific groups such as small churches or scout and guiding groups. To reduce the uncertainty of statistical estimates the sample is stratified by income, essentially on a log10 scale (see Table 1). Weights were used during the analysis to ensure unbiased estimates using the 'Survey Package' in R (Lumney, 2010), with a finite population correction applied when necessary. Larger charities have generally been sampled more heavily to prioritise the estimation of totals for the NCVO Almanac (Kane et al. 2013).

To focus on the most relevant population of organisations, a few further restrictions were imposed on the sample. As specified in the literature review, debates on state funding generally concern organisations providing 'welfare' or 'human' services. As such, organisations that *only* offer support to other organisations were excluded. So too were organisations that have no delivery operations within the UK. In line with the structural operational definition of the voluntary sector (Salamon and Anheier, 1997), organisations that were either not fully self-governing or independent were excluded, such as non-departmental government bodies or NHS charities (Hands et al., 2008). Charities were not excluded on the basis of their level of voluntary input, however, as this was of course the major outcome variable for the study.

A final restriction relates to the size of charity for which representative data is available. The latest year of the accounts data publicly available is for the financial year 2012-2013. This was also the first year that the relevant question on volunteers was made compulsory. This

appears to have substantially improved the amount of data available for the Part B charities, 95% of which provided valid volunteer data. Unfortunately, it was discovered during the initial analysis that the data made available for the smaller charities is mainly missing until the year 2015, and these missing values do not seem to be 'missing at random'. This means that for this study, analysis on volunteers was only feasible for the substantially smaller number of Part B charities. The number of cases at different size strata are summarised in Table 1, both for the sample used for this study and the target population. The final sample stands at 4,576 cases from a total population of 7,684 eligible Part B charities.

Key variables

Outcome variables:

The main outcome variables used to measure volunteer levels were derived from headcounts of volunteers and staff included in Part B of the charity annual returns:

- the probability of VSOs having any volunteers at all (excluding trustees)
- the absolute number of volunteers in VSOs
- the proportion of volunteers, out of VSOs' total workforce (volunteers and employees)

They are of course only a partial indicator of volunteer input as they do not measure the intensity of individual volunteers' involvement. The distribution of the volunteer count is heavily skewed, and 34 per cent of the Part B Charities recorded zero volunteers. Excluding zero values, the mean number of volunteers for Part B charities is 667 and the median is 48, indicating a very large degree of skew. In order to mitigate the impact of skew and extreme cases, group medians were compared during the bivariate analysis as well the means, and the logarithm transformation (base 2) was applied to the income and count variables. The number of zero values for staff is much lower than for volunteers, at just 3.6%, though this raises doubts over whether zeros have simply been recorded as missing instead. If we focus on the

65% of the Part B charities with non-missing and non-zero values for both staff and volunteers, then the mean *proportion* of volunteers is .55 and the median is .58. This reflects the fairly uniform distribution for volunteers as a proportion, with a slight degree of negative skew.

Input variables:

Each of the outcome variables was explored in relation to state income, similarly divided into three measures:

- the probability of VSOs having any state income at all
- the amount of state income, if any
- the proportion of state income, out of VSOs' total income

State income here refers specifically to funding from the core elements of the UK state, including central, regional, local, and town and parish government, NHS trusts and devolved administrations. More independent or international bodies were not included. 41 per cent of charities received no state funding at all, much higher than the proportions than that received no investment or individual income (8 and 4 per cent respectively, see Figure 1 A). Even excluding the zero values, state income is extremely skewed (Figure 2A). For those Part B charities that do receive some state income, the mean amount is £2,651,545 and the median is £560,586 (Figure 1B). Finally, as with volunteers, we can look at state income as a proportion, this time of total income. Figure 2B shows the distribution of this variable, again excluding zero values. There remains a peak for the very lowest values, but in general the distribution is much more uniform. The mean *proportion* of state income is .44 and the median is .39. Less than 1 per cent of Part B charities that receive state income receive absolutely all of their income from the state.

Control variables:

Finally, three control variables with backing in the literature and valid indicators in the data were also identified:

- the size of the organisations according to their income
- their service field or industry, as measured using the International Classification of Non-profit Organisations (ICNPO)
- whether the state funding is in the form of contracts or grants

The relationships between each of the key input and output variables were explored during the analysis using a combination of graphs, correlation summaries and linear modelling. Co-plots and covariates in the linear models were used to explore potential moderating or mediating effects. Sampling uncertainty is shown throughout the analysis using 95 per cent confidence intervals, avoiding the all or nothing thinking which can be encouraged by null-hypothesis testing (Field, 2013).

Analysis

State income levels versus volunteer levels

This section explores the relationships between the study's main continuous variables. These include state income and volunteers, both in absolute and proportional terms, for those Part B charities with at least some volunteers and some state income.

One of the most important relationships, between state income as a proportion of total income and volunteers as a proportion of the workforce, is consistent with the negative relationships found in much of the previous case study based research (Alcock et al, 2004; Chater, 2008). The loess curve in Figure 3A shows a clearly negative trend, accelerating at the higher levels of state income as a proportion. It is possible to distinguish two clusters of cases in the top-left and bottom-right of the graph, indicating a prevalence of charities with a very high score on one variable, and a very low score on the other. The linear correlation coefficient is a moderate -0.23 . Table 2 shows that this was the strongest correlation found between any of the main variable combinations explored in this study. The potential for size to act as a confounding variable was ruled out using co-plots and linear modelling, exploring the relationship at different levels of total income. The size of the relationship was virtually unchanged when size was held constant.

Size does play a major role if the variables remain in absolute terms. As shown in Table 2, the linear correlation between \log_2 state income and \log_2 volunteers is slightly positive ($r = 0.14$), but this is entirely due to the confounding influence of total income. Charities with higher overall incomes are likely to have more volunteers and higher state income, assuming they have at least some of both. Included as a single predictor of \log_2 volunteers, \log_2 state income has a coefficient of 0.14 , but this drops to -0.06 when \log_2 total income is included as a second predictor, holding size constant (see Table A1). After controlling for size, therefore, this negative coefficient is consistent with the idea that state income is related to lower

volunteer levels. Table 2 also shows that if only one of the key variables is expressed as a proportion and the other is left in absolute terms, a negative relationship remains ($r = -0.22$ and $r = -.17$).

The results for contract income also suggest a negative relationship with volunteer levels. The correlation between contract income as a proportion of total income and volunteers as a proportion of volunteers and staff is $-.21$. In contrast, however, the same relationship using voluntary state income (grants) is almost entirely absent ($r = .02$). This also fits with the literature critical of state funding, which suggests that grant funding is much more consistent with voluntary action than contracts (Benson, 2014).

Having any state income versus having any volunteers

Once we start looking at the influence of having any state income at all, rather than the amount or proportion, however, the picture becomes more complicated. The probability of having at least some state income is positively related to the probability of having at least some volunteers, as shown in Figure 4A. 56 per cent of those with no state funding use volunteers, compared to 73 per cent of those with at least some state income. The correlation between the two binary variables is $.18$ (Table 2). The relationship is almost unchanged at different levels of total income and applies to voluntary and contractual state funding. This does *not* seem to support the idea of a negative relationship between state income and volunteering levels.

Potentially, this finding may be related to the 'type' of charities involved and the nature of their activities. Some of these differences can be captured by charities' industry or service area. If we include all the ICNPO categories as co-variants within a logistic regression model to predict the log odds of having any volunteers, then the coefficient for having any state income drops from 0.78 to 0.48 (see Table A3). To illustrate how the relationship varies between ICNPO categories, Figure 5 shows the same relationship as Figure 4 within three

illustrative categories, Housing Charities, Social Services, and Environment Charities. Each of these has a reasonable number of unweighted cases and sufficient variation to illustrate how the relationship between having any state income and any volunteers can differ between the ICNPO categories.

Having any state funding versus absolute volunteer levels

Charities with at least some state funding also have a higher average number of volunteers.

The mean number of volunteers is 353 for those with no state funding and 835 for those with at least some, excluding those with zero volunteers in both cases (Figure 6A). The respective medians for both groups are 33 and 50 (Figure 6B). The correlation between having any state income and the log2 number of volunteers is .10, a small but still noteworthy effect (see Table 2). Similar results were found regardless of whether the state funding was voluntary or contractual. This again seems to present a somewhat unexpectedly positive relationship between state income and volunteering, but may, again, be at least partially due to the different 'types' of charity in each group. Controlling for industry in a linear model predicting log2 volunteers reduces the coefficient for having any state income from 0.60 to 0.38 (see Table A4).

Holding total income constant makes little difference to the overall result, reducing the coefficient for having any state income down only slightly to 0.55 in Table A4. Further examination using co-plots; however, reveals an interaction effect occurring between having any state income and total income. Specifically, the positive difference appears to emerge only as the charities involved become larger. For charities with an income over £1 million, state funded charities have a mean of 393 volunteers and non-state funded a mean of 1213. The medians are 34 and 63 respectively. We can only speculate for the reasons behind this interaction, but it may be that at higher levels of funding, receiving any state income at all becomes more of a distinguishing factor due to the higher monetary stakes involved.

Having any state funding versus proportional volunteer levels

When the outcome variable is changed to volunteers as a proportion of both staff and volunteers, excluding all zero values, there is little difference between those with and without state income in either direction. The mean proportion for those with no state income is .54 and .55 for those with at least some. The medians are .59 and .58 respectively and the correlation between the two variables is negligible at .01 (see Table 2). The type of state income involved again makes little difference. This means that although the relevant charities with at least some state income use on average more volunteers, they must also use more employees. This fits with the idea that state funded charities are performing different types of activities, which require greater human resources, both voluntary and paid.

Again, there is an interaction with total income, and co-plots do reveal a positive relationship amongst the very highest categories. For charities with an income over £10 million, state funded charities have a mean proportion of volunteers of .40, while the mean for those with no state funding was .31. The respective medians were .34 and .12. For the very largest charities, therefore, having state income must increase the average number of volunteers more than it does the number of staff. In any case, the results at all size levels remain inconsistent with the idea of a negative relationship between state income and volunteer levels.

Absolute state funding versus having any volunteers

Finally, the relationship between the amount of state funding and the probability of having any volunteers also fails to exhibit a relationship consistent with the hypothesis. Figure 7 shows the estimated probability of having any volunteers, for different intervals of state income (boundaries increasing by 2 on a log2 scale and excluding zero values). The confidence intervals for the first few categories are very wide due to the smaller number of cases at those levels. Overall, it is difficult to identify a consistent pattern that would support

the idea of a negative relationship. The linear trend is slightly positive, as indicated by a logistic regression model shown in Figure 7, transformed to show changes in the predicted probability of having any volunteers. The trend is quite weak, however, and it may even begin to reverse slightly at higher levels of state income, indicating some non-linearity. The correlation is also relatively small at .06 (see Table 2).

Using co-plots to control for the relationship in Figure 7 does not work well due to the rapidly decreasing number of cases per sub-category. Adding ICNPO category dummy variables to the linear model, however, seems to absorb almost all of the variation previously accounted for. Controlling for log2 total income actually increases the log2 state income coefficient from 0.05 to 0.10. But this may still just be reflecting the effect of ICNPO categories, as including both covariates once again appears to render state income (and total income) almost insignificant.

The relationship shown in Figure 7 is very similar if just contract state funding is considered, but the results for voluntary state income are quite distinctive. In a linear model the coefficient for log2 voluntary state income is -0.11, clearly negative. The coefficient also stands up much better to the inclusion of total income or ICNPO categories, and remains at -0.10 when both covariates are included. This somewhat surprising finding does not seem consistent with the idea that grant funding has less of an impact on charities than state contracts.

Proportional state funding versus having any volunteers

Using proportional state income as the predictor yields similar results, which again does not provide much support for the idea of a negative relationship between state income and volunteering. Again there is a very slight positive trend, with a correlation of .06 (see Table 2), though Figure 8 suggests there is very limited variation in the probability of having any volunteers across the x-axis categories. There is also some non-linearity visible, particularly a

dip for those with the highest proportions of income from the data, which is not captured well by the logistic regression model. Adding log2 total income into the model makes almost no difference in this case, whereas adding ICNPO categories renders the state income as a proportion coefficient too uncertain to interpret. Similar to when using absolute state income, using voluntary state income as a proportion of total income produces a negative relationship ($b = -.22$ in a linear model), even if both covariates are included ($b = -.47$).

Discussion

The literature outlined at the start of this paper warned that state funding may contribute to a diminution in voluntarism within VSOs and ultimately a reduction in volunteer levels (Rochester, 2014; Scott and Russell, 2001). If this is true, a negative association at the sector level would be observable. How seriously, therefore, should we take these concerns on the basis of this study's findings? Taken as a whole, the results are complex and suggest the need for a nuanced view of the overall relationship.

Notably, for those with at least some state funding and at least some volunteers, there is a modest, negative correlation between proportional state income and proportional volunteers. On the other hand, for charities with at least some state funding, higher levels of state funding, either proportional or absolute, do not appear to be obviously related to whether charities have any volunteers at all.

Differences were also observed between charities with some state funding and those with none at all. Organisations with at least some state income were *more* likely to use at least some volunteers than those with no state funding at all. And amongst VSOs which did have at least some volunteers (besides trustees), those with at least some state funding had on average a higher numbers of volunteers.

Potentially, the somewhat divergent findings may be because those that receive at least some state funding constitute a particular 'type' of charity, more heavily involved in personal welfare services and therefore more likely to make use of both volunteers and deliver state contracts. This seems consistent with the finding that state funded charities do not have more volunteers *as a proportion* of their workforce, meaning they must also employ more paid staff than their counterparts with no state funding. A clear interaction effect between ICNPO categories and the strength of the state income-volunteer relationship also seems consistent

with this explanation, but is one that merits further investigation. There may well be other ways, unobserved, that these two types of charity differ.

Whilst some of the results presented here are therefore consistent with the negative overall relationship hypothesised (Alcock et al. 2004; Chater, 2008), there is no straightforward bifurcation in volunteer levels between those with and without any state income, or those with higher or lower state funding levels. At the sector level, it certainly does not appear true that state funding and voluntarism are fundamentally incompatible (Seddon, 2007; Knight, 1993), or that state funding has 'crowded out' volunteers to a great degree (Bredtmann, 2016). Many organisations seem to be successfully maintaining volunteer levels alongside their state income, in contrast to the idea of separate spheres of responsibility between sectors (Seddon, 2007; NCIA, 2013). Given some of the positive relationships unearthed, the two different spheres may even be operating as part of a 'complementary' relationship, rather than as part of a 'supplementary' division between voluntary and state driven efforts (Young, 2000).

On the other hand, even if they are rather modest in scale across the entire sector, and remain only cross-sectional correlations, the more negative relationships uncovered mean it cannot be ruled out that the concerns at the case study level may be replicated more widely. If volunteer input is part of what makes the voluntary sector a valuable partner (PASC, 2008; HMT, 2002), then steps by commissioners to recognise and protect the role of volunteers seems well advised (Chater 2008; Morris 1999). Salamon (1987) explicitly references the threats to voluntarism from 'over-professionalization'. He suggests that the government can help by avoiding undue interference in service delivery and providing less restrictive grants as well as contracts, which remains a proportionate conclusion given the current evidence base.

Limitations / further research

There are, however, some limitations to the study and data which future work may help to address. Most importantly, whilst observational data can rule out causal relationships, there are clear limits to what can be interpreted from cross-sectional data. It cannot be said on the basis of these findings that changes to state income levels lead to higher or lower volunteer levels, particularly given that the role of unobserved covariates may be substantial. This paper has suggested that this may particularly be the case for the differences between those with at least some state funding as those with none, though it applies to all the results. As further years of volunteer data become available, the use of panel analysis may help to partially address these issues, allowing researchers to control for any time invariant variables that remain unaccounted for.

Given the study was somewhat exploratory, and a number of new findings were uncovered such as non-linearity, interaction effects, and distinct effects relating to having zero state income, further confirmatory work would also be valuable which explicitly models these features. It may also be possible in subsequent years to extend the analysis to the smaller charities which do not fill in Part B of the annual returns.

Furthermore, although a substantial improvement on previous data sources, there are some limitations to the accounts dataset that warrant further discussion. First, the quality of the data is dependent on the quality of the accounts. The degree of external scrutiny charities are subjected to varies by size. Only those with over £250,000 of annual income are expected to follow the 'Statement of Recommended Practice' and submit accounts on an accrual basis. Only those with an income over £1 million are expected to be externally audited. This allows charities' a great deal of latitude on how they record their accounts, especially for smaller organisations.

The variation in the information recorded also makes classification of the accounts data difficult, especially as due to the scale of the task most allocations need to be automated using key word matching. The details of the processes used are outlined in Kane et al. (2013), but unsurprisingly insufficient or ambiguous information introduces challenges. The difficulties, however, should not be overstated. Many cases are not ambiguous. The analysis in this paper also focussed on the larger Part B charities, for who the accounts data and classifications are more reliable. The dataset is certainly the best available for this type of research within the UK, and arguably internationally, and will improve further with future developments in machine learning and potentially improvements to the way accounts are collected.

Finally, the wider literature hypothesises that state income may potentially influence a much wider range of VSO characteristics than just volunteer numbers, including financial stability and administrative spending (Bennett, 2016; Buckingham, 2009). The findings of this exploratory study have hopefully demonstrated the potential of the accounts dataset to explore the impact of state funding and can act as a springboard for further relevant quantitative research in these areas.

References

- Alcock, P. (2008), *Social Policy in Britain*, 3rd ed., Basingstoke: Palgrave Macmillan
- Alcock, P., Brannelly, T. and Ross, L., (2004) *Formality or flexibility? Voluntary sector contracting in social care and health*, Birmingham: University of Birmingham
- Bartels, K. and Cozzi, G. and Noemi, M. (2011) *Public Spending and Volunteering: "The Big Society", Crowding Out, and Volunteering Capital*. Munich Personal RePEc Archive Paper No. 29730, March, Munich: MPRA
- Bennett, H. (2016) 'Re-examining British Welfare-to-Work Contracting using a Transaction Cost Perspective', *Journal of Social Policy*, **46**(1), pp.129-148
- Benson, A. (2014) *"The Devil that has come amongst us", The impact of commissioning and procurement practices*, NCIA Inquiry into the Future of Voluntary Services Working Paper 6, May, London, NCIA
- Billis, D. (2010) 'Towards a theory of hybrid organisations'. In D. Billis (ed.) *Hybrid organisations and the third sector: Challenges for practice, theory and policy*, Basingstoke, Palgrave Macmillan
- Billis, D. and Harris, M. (1992) 'Taking the strain of change: British local voluntary agencies enter the post-Thatcher period' *Nonprofit and Voluntary Sector Quarterly*, **21**(3), pp.211-25
- Billis, D. and Harris, M. (1996) 'Conclusion: Emerging Challenges for Research and Practice'. In D. Billis and M. Harris (eds.) *Voluntary Agencies: Challenges of Organisation and Management*, Basingstoke, Macmillan
- Billis, D. and Glennerster, H. (1998) 'Human services and the voluntary sector: Towards a theory of comparative advantage', *Journal of Social Policy*, **27**(1), pp.79-98

Bredtmann, J. (2016) *Does government spending crowd out voluntary labor and donations?*, IZA World of Labor paper 299, September, Bonn: IZA World of Labor

Buckingham, H. (2009) 'Competition and contracts in the voluntary sector: exploring the implications for homelessness service providers in Southampton', *Policy and Politics*, **37**(2), pp.235-254

Buckingham, H. (2012) 'Capturing Diversity: A Typology of Third Sector Organisations' Responses to Contracting Based on Empirical Evidence from Homelessness Services', *Journal of Social Policy*, **41**(3), pp 569-589

Carmel, E. and Harlock, J. (2008) Instituting the “third sector” as a governable terrain: partnership, procurement and performance in the UK, *Policy & Politics*, **36**(2), pp.155–71

Charity Commission (2013) *Charity Reporting and Accounting: The essentials*, January, London, The Charity Commission

Chater, D. (2008) *Coming in from the cold? The impact of the contract culture on voluntary sector homelessness agencies in England*, Voluntary Sector Working Paper 10, June, London, LSE

Clifford, D. and Mohan, J. (2016) 'Which third sector organisations are involved in the delivery of public services? Evidence from national survey data in England'. In J. Rees and D. Mullins (eds.) *The third sector, Delivering public services, Developments, innovations and challenges*, Bristol, Policy Press, pp.63-84

Cunningham, I. (2008) 'A Race to the Bottom? Exploring variations in employment conditions in the voluntary sector' *Public Administration*, **86**(4), pp.1033–53

Dahlberg, L. (2005) 'Interaction between Voluntary and Statutory Social Service Provision in Sweden: A Matter of Welfare Pluralism, Substitution or Complementarity?', *Social Policy and Administration*, **39**(7), pp.740–763

Dart, R. (2004) 'Being “Business-Like” in a Nonprofit Organization: A Grounded and Inductive Typology', *Nonprofit and Voluntary Sector Quarterly*, **33**(2), pp.290-310

Dayson, C. and Wells, P. (2013) 'Voluntary and Community Sector Policy under the Coalition Government', *People, Place and Policy*, **7**(2), pp.91-99

DiMaggio, P.J. and Anheier, J.K. (1990) 'The Sociology of Nonprofit Organizations and Sectors', *Annual Review of Sociology*, **16**(1), pp.137-159

DiMaggio, P.J. and Powell, W.W. (1983) 'The Iron Cage Revisited: Institutional Isomorphism and Collective Rationality in Organizational Fields', *American Sociological Review*, **48**(2), pp.147-160

Department of Communities and Local Government (DCLG) (2011), *Citizenship Survey: 2010-11*, England, Cohesion Research Statistical Release Number 16, London: DCLG

Eikenberry, A. (2009) 'Refusing the Market A Democratic Discourse for Voluntary and Nonprofit Organizations', *Nonprofit and Voluntary Sector Quarterly*, **38**(4), pp.582-596

Enjolras, B. (2002) 'Does the commercialization of voluntary organizations ‘crowd out’ voluntary work?', *Annals of Public and Cooperative Economics*, **73**(3), pp.375-398

Field, A. (2013) *Discovering Statistics Using IBM SPSS Statistics*, 4th ed., London, Sage Publications

Geoghegan, M and Powell, F. (2006) 'Community Development, Partnership Governance and Dilemmas of Professionalization: Profiling and Assessing the Case of Ireland', *British Journal of Social Work*, **36**(5), pp.845–861

Hands, D., Coleman, L., Hems, L., Bovaird, T. and Johnson, D. (2008) *The environment for a thriving third sector – chapter 3: determining the survey population*, Research Report, April, Birmingham, BMG Research

Hedley, R. and Davis Smith, J. (1994) *Volunteers and the Contract Culture*, Voluntary Action Research, Third Series, Paper 1, London, The Volunteer Centre UK

Independence Panel (2011) *Voluntary Sector independence*, July, London, The Baring Foundation

Independence Panel (2015) *An independent mission: the voluntary sector in 2015*, February, London, The Baring Foundation

Ipsos MORI (2008) *National Survey of Third Sector Organisations*, London, Cabinet Office

Ipsos MORI (2010) *National Survey of Charities and Social Enterprises*, London, Cabinet Office

Kane, D., Clark, J., Clifford, D., Mohan, J., Dobbs, J. and Bass, P. (2013), *Collecting and classifying data from charity accounts for England and Wales*, Working Paper 93, January, Birmingham: TSRC

Knight B. (1993) *Voluntary Action*, London, Home Office

Kramer, R.M. (1994) 'Voluntary Agencies and the Contract Culture, "Dream or Nightmare?"', *Social Service Review*, **68** (1), pp.33-60

Leiter, J. (2013), 'An Industry Fields Approach to Isomorphism Involving Australian Nonprofit Organizations', *Voluntas*, **24**(4), pp.1037–1070

Macmillan, R. (2013), Distinction in the third sector, *Voluntary Sector Review*, **4**(1), pp.39-54

Maier, F. Meyer, M. and Steinbereithner, M. (2016) 'Nonprofit Organizations Becoming Business-Like: A Systematic Review', *Nonprofit and Voluntary Sector Quarterly*, **45**(1), pp.64-86

Milbourne, L. and Cushman, M. (2015) 'Complying, transforming or resisting in the new austerity? Realigning social welfare and independent action among English voluntary organisations', *Journal of Social Policy*, **44**(3), pp.463-485

Milbourne, L., (2013) *Voluntary Sector in Transition: Hard Times or New Opportunities?*, London, Policy Press

Mohan, J. and McKay, S. (2017) 'The prevalence and distribution of high salaries in English and Welsh charities', *Social Policy & Society*, **17**(2), pp.173-191

Morris, D. (1999) *Charities and the Contract Culture: Partners or Contractors? Law and Practice in Conflict*, Liverpool, Liverpool University Charity Law Unit

Morris, D. (2000) 'Charities in the contract culture: survival of the largest?', *Legal Studies*, **20**(3), pp.409–427

National Coalition for Independent Action (NCIA) (2013) *Position paper on the role of the state and voluntary services agencies in the provision of public services – outline brief*, NCIA Inquiry into the Future of Voluntary Services, London: NCIA

NCVO (2017) UK Civil Society Almanac 2015, NCVO Almanac Series, [online], Available at: <https://data.ncvo.org.uk/>

Nichols, G., Knight, C., Mirfin-Boukouris, H. Uri, C. (2016) *Motivations of Sport Volunteers in England A review for Sport England* [online]. Available at: <https://www.sportengland.org/media/10205/motivations-of-sport-volunteers.pdf>

Pfeffer, J. and G.R. Salancik (1978) *The External Control of Organizations: A Resource Dependence Perspective*. New York: Harper and Row

Public Administration Select Committee (PASC) (2008) *Public Services and the Third Sector: Rhetoric and Reality Eleventh Report of Session 2007–08*, Volume I, June, HC 112–I, London: The Stationary Office

Rochester, C. (2013) *Rediscovering Voluntary Action. The Beat of a Different Drum*, Basingstoke, Palgrave Macmillan

Rochester, C. (2014), *The impact of commissioning and contracting on volunteers and volunteering in Voluntary Services Groups*, NCIA Inquiry into the Future of Voluntary Services Working Paper 8, October, London, NCIA

Salamon, L. M. (1987) 'Partners in public service: toward a theory of government nonprofit sector relations'. In W. W. Powell, *The nonprofit sector: a research handbook*, New Haven, Yale University Press

Salamon, L.M. and Anheier, H. (1997) 'Towards a common definition'. In L. M. Salamon and H. Anheier, *Defining the nonprofit sector: a cross-national analysis*, Manchester: Manchester University Press, pp.29-50

Salamon, L., Sokolowski, S.W., List, R., (2003) *Global Civil Society An Overview*,
Baltimore: Centre for Civil Society Studies

Scott, D.W. and Russell, L. (2001) 'Contracting: the experience of service delivery agencies'.
In M. Harris and C. Rochester (eds.), *Voluntary organisations and social policy in Britain: perspectives on change and choice*, Basingstoke, Palgrave, pp.49-63

Seddon, N. (2007) *Who Cares? How State Funding and Political Activism Change Charity*,
London, Civitas

Seippel, Ø. (2002) 'Volunteers and Professionals in Norwegian Sport Organizations',
Voluntas, **13**(3), pp.253-270

Simmons, W.O. and Emanuele, R. (2004) 'Does government spending crowd out donations of time and money?', *Public Finance Review*, **32**, 5, 498-511

Smith, R.S. and Lipsky, M. (1993) *Nonprofits for Hire: The Welfare State in the Age of Contracting*, Cambridge, MA, Harvard University Press

Stadelmann-Steffen, I. (2011) 'Social Volunteering in Welfare States: Where Crowding Out Should Occur', *Political Studies*, **59**, pp.135-155

Taylor, M. (1996) 'What are the Key Influences on the Work of Voluntary Agencies?'. In D. Billis and M. Harris (eds.) *Voluntary Agencies: Challenges of Organisation and Management*, Basingstoke, Macmillan, pp.13-28

UK Statistics Authority (UKSA) (2012) *Official Statistics and the Voluntary Sector*,
Monitoring Brief, May London, UKSA. Available at: www.statisticsauthority.gov.uk/reports--correspondence/correspondence/letter-from-andrew-dilnot-to-nick-hurd-03052012.pdf

van Oorschot, W. and Arts, W. (2005) 'The social capital of European welfare states: the crowding out hypothesis revisited', *Journal of European Social Policy*, **15**(1), pp.5-26

Young, D.R. (2000) 'Alternative models of government-non-profit sector relations: Theoretical and international perspectives', *Non-profit and Voluntary Sector Quarterly*, **29**(1), pp.149-172

Young, D.R., Wilsker, A.L. and Grinsfelder, M.C. (2010) 'Understanding the determinants of non-profit income portfolios', *Voluntary Sector Review*, **1**(2), pp.161-73

R packages

R Core Team (2015) R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria

Lumley, T. (2016) survey, v.3.35

Pasek, J. (2016) weights, v.0.85

Wickham, H. (2015) readxl, v.0.1.0

Wickham, H. (2015) stringr, v.1.0.0

Wickham, H. (2016) forcats, v.0.1.1

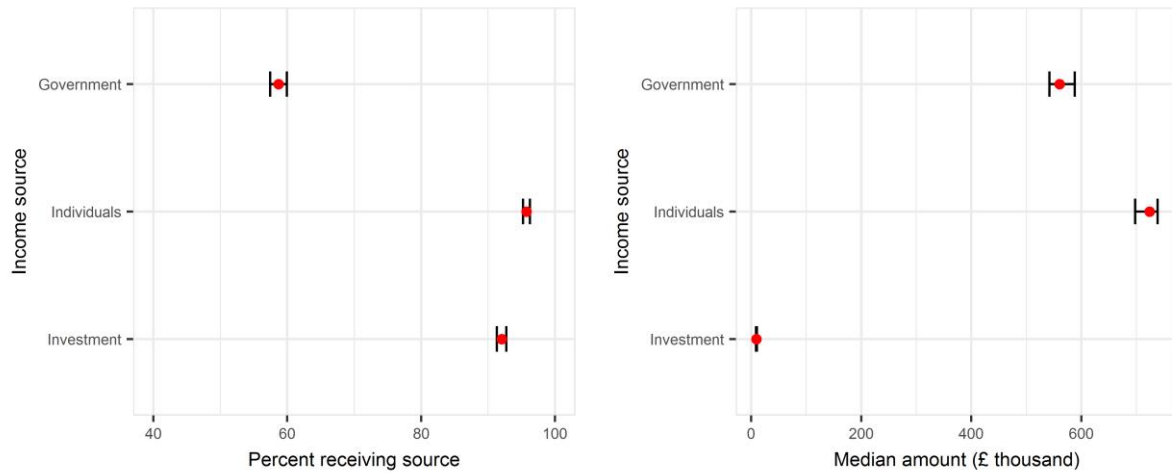
Wickham, H. (2016) gtable: v.0.2.0

Wickham, H. (2016) modelr: v.0.1.0

Wickham, H. (2016) tidyverse: v.1.0.0

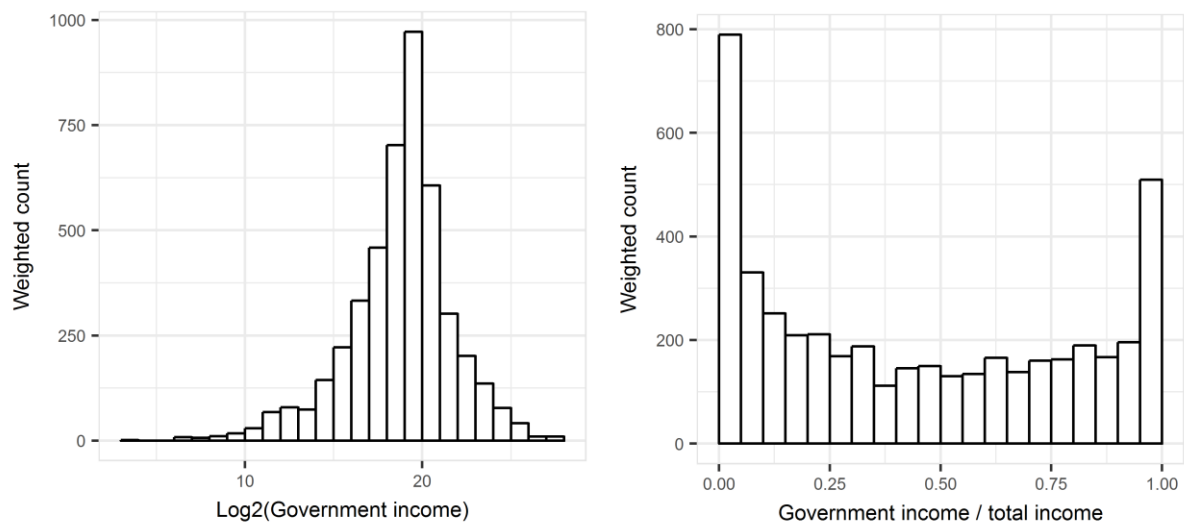
Figures

Figure 1: Three largest income sources - percentages receiving any and median amounts



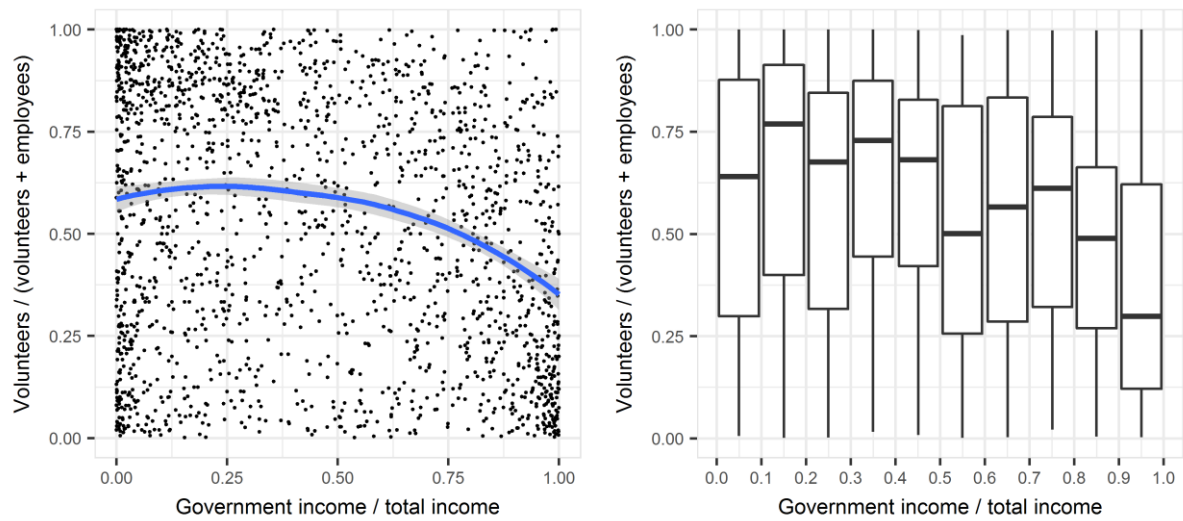
A (left): Percentage of Part B charities receiving any of the three largest income sources. **B (right):** Median amount of funding from each of the three largest income sources, excluding zero values for each source.

Figure 2: State income distribution - absolute and proportional



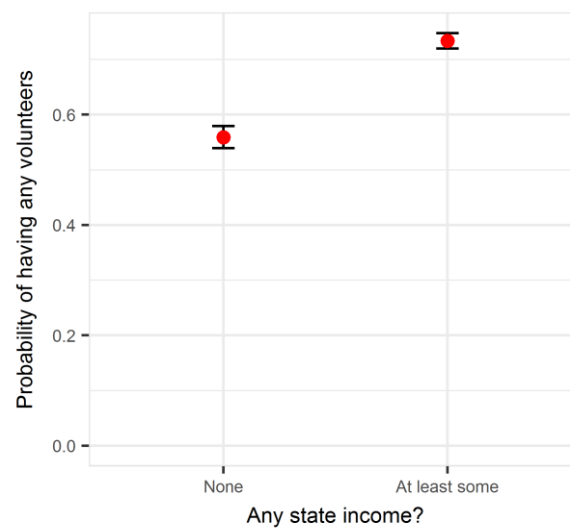
A (left): State income on a log 2 scale histogram. Bin width equals 1. **B (right):** State income as a proportion of total income histogram. Bin width equals .05. Both graphs include only Part B charities with at least some state income. Bins are right-closed.

Figure 3: Proportional volunteer levels versus proportional state income



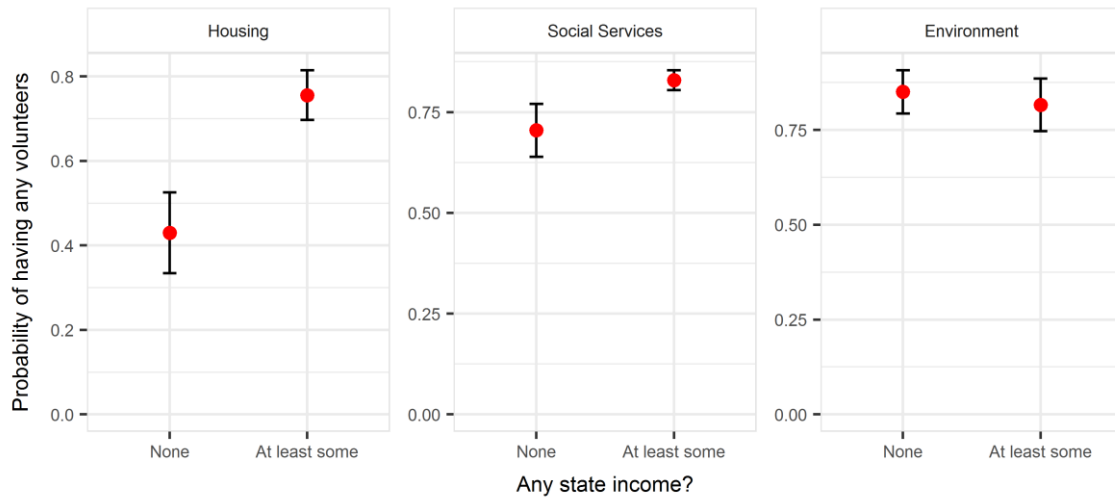
A (left): Proportion of volunteers in workforce versus state income as a proportion of total income. The curved line is a loess curve with a 95% confidence band. **B (right):** Box plots showing the proportion of volunteers in the workforce at 10 equal intervals of state income as a proportion of total income. Both graphs contain Part B charities with at least some volunteers, staff and state income.

Figure 4: Having any volunteers versus having any state income



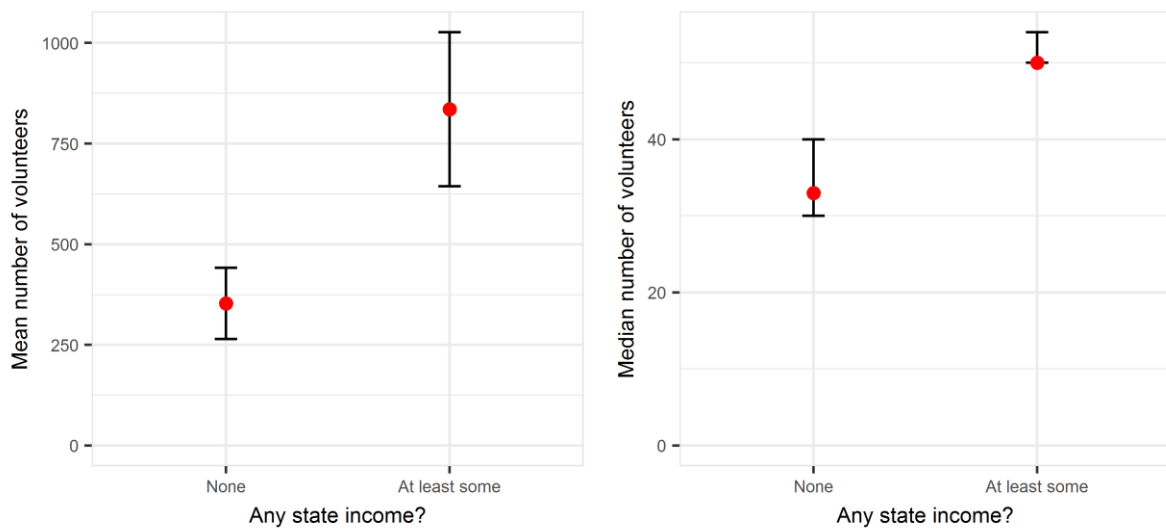
Probability of having any volunteers for Part B charities with and without any state income.

Figure 5: Having any volunteers versus having any state income and ICNPO categories



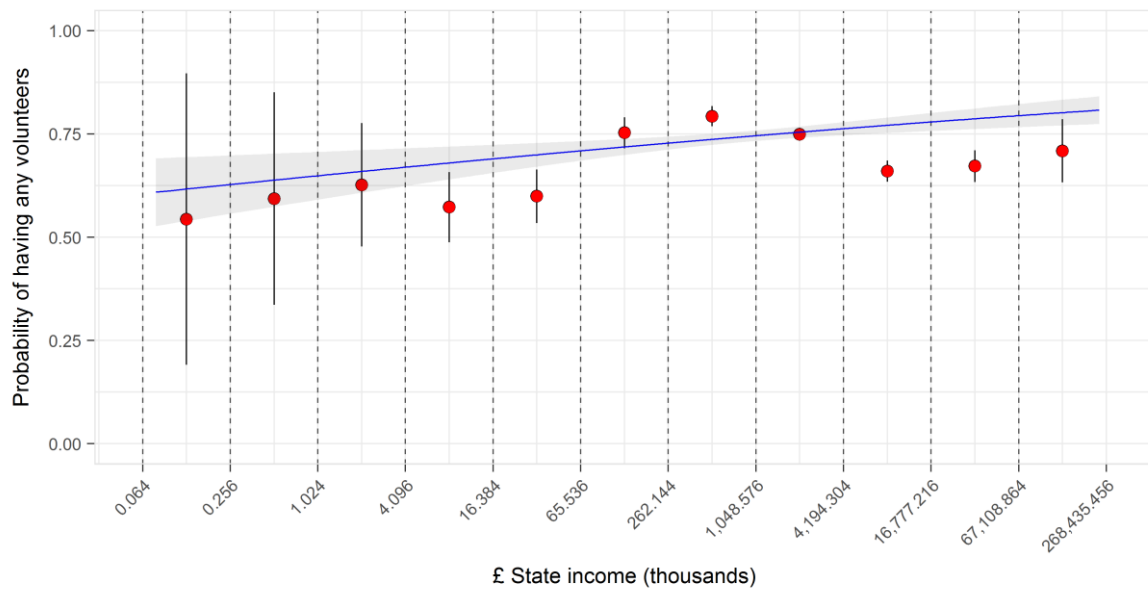
Probability of having any volunteers for Part B charities with and without any state income, within the Housing, Social Services and Environment ICNPO categories.

Figure 6: Volunteer numbers versus having any state income



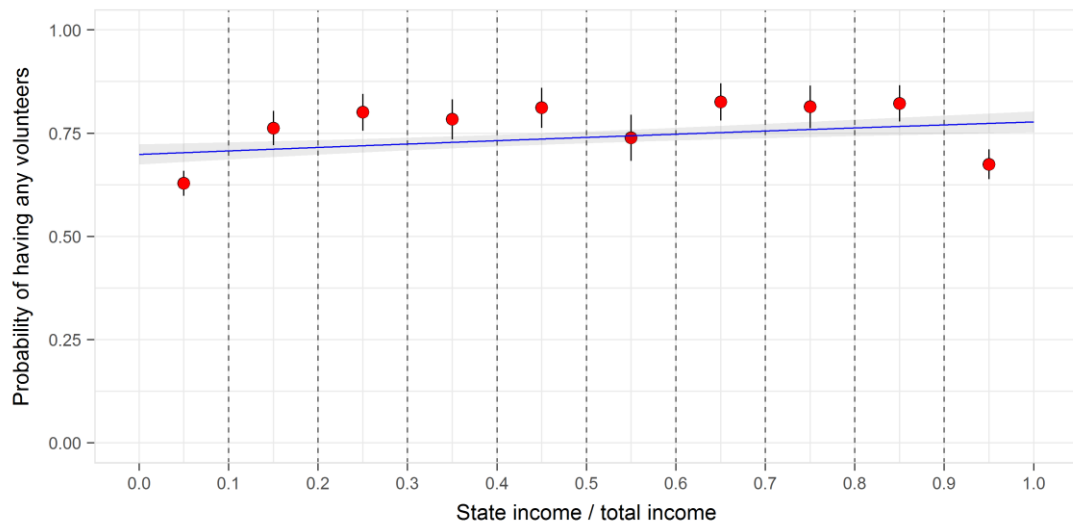
A (left): Mean number of volunteers for Part B charities with and without any state income. **B (right):** The median number of volunteers for Part B charities with and without any state income.

Figure 7: Any volunteers versus log2 state income



Probability of Part B charities having any volunteers versus log2 state income. Vertical grey lines mark the boundaries of 11 state income categories, increasing on a log2 scale. The straight, solid line across the figure marks a logistic regression model for un-banded log2 state income, with a grey 95% confidence band.

Figure 8: Having any volunteers versus proportional state income



Probability of Part B charities having any volunteers versus state income as a proportion of total income. Vertical grey lines mark boundaries of 10 equal categories for state income as a proportion of total income. The straight, solid line across the figure marks a logistic regression model for un-banded log2 state income, with grey a 95% confidence band.

Tables

Table 1: Sample size for each size stratum in the 2012-2013 accounts dataset
(Part B charities only)

Size category	Population n	Unweighted n - sample dataset
Medium (£500,001 to £1,000, 000)	2,692	650
Large (£1,000,001 to £10,000,000	4,155	3,228
Major 1 (£10,000,001 to £100,000,000)	790	656
Major 2 (£100,000,001 plus)	47	42
Total	7,684	4,576

During the analysis, finite population corrections were applied by the 'Survey' Package in R where the proportion of the population stratum sampled was sufficiently high

Table 2: Correlation Matrix between key variables

	State income > 0	Log 2 state income (if state income > 0)	State income as a proportion of total income (if state income > 0)
Volunteers > 0	.18	.06	.06
Log 2 volunteers (if volunteers > 0)	.10	.14	-.17
Volunteers as a proportion of both volunteers and staff (if volunteers > 0)	.01	-.22	-.23

Appendix A: Linear modelling

Table A1

Model	log2(govt_inc) coefficient	Standard error	Test statistic	p value
log2(volunteers) ~ log2(govt_inc)	0.14	0.02	9.42	0.00
log2(volunteers) ~ log2(govt_inc) + log2(total_inc)	-0.06	0.02	-3.73	0.00
log2(volunteers) ~ log2(govt_inc) + ICNPO	0.14	0.02	8.71	0.00
log2(volunteers) ~ log2(govt_inc) + ICNPO + log2(total_inc)	-0.14	0.02	-6.81	0.00

Table A2

Model	govt_inc / total_inc coefficient	Standard error	Test statistic	p value
volunteers / total_workforce ~ govt_inc / total_inc	-0.21	0.02	-13.21	0.00
volunteers / total_workforce ~ govt_inc / total_inc + log2(total_inc)	-0.22	0.02	-14.44	0.00
volunteers / total_workforce ~ govt_inc / total_inc + ICNPO	-0.23	0.02	-12.10	0.00
volunteers / total_workforce ~ govt_inc / total_inc + ICNPO + log2(total_inc)	-0.22	0.02	-12.29	0.00

Table A3

Model	govt_inc > 0 coefficient	Standard error	Test statistic	p value
volunteers > 0 ~ govt_inc > 0	0.78	0.06	14.08	0.00
volunteers > 0 ~ govt_inc > 0 + log2(total_inc)	0.79	0.06	14.24	0.00
volunteers > 0 ~ govt_inc > 0 + ICNPO	0.48	0.06	7.42	0.00
volunteers > 0 ~ govt_inc > 0 + ICNPO + log2(total_inc)	0.49	0.07	7.58	0.00

Table A4

Model	govt_inc > 0 coefficient	Standard error	Test statistic	p value
log2(volunteers) ~ govt_inc > 0	0.60	0.09	6.72	0.00
log2(volunteers) ~ govt_inc > 0 + log2(total_inc)	0.55	0.09	6.20	0.00
log2(volunteers) ~ govt_inc > 0 + ICNPO	0.38	0.09	4.09	0.00
log2(volunteers) ~ govt_inc > 0 + log2(total_inc) + ICNPO	0.20	0.09	2.19	0.03

Table A5

Model	govt_inc > 0 coefficient	Standard error	Test statistic	p value
volunteers / total_workforce ~ govt_inc > 0	0.00	0.01	0.46	0.65
volunteers / total_workforce ~ govt_inc > 0 + log2(total_inc)	0.01	0.01	0.98	0.33
volunteers / total_workforce ~ govt_inc > 0 + ICNPO	-0.03	0.01	-2.64	0.01
volunteers / total_workforce ~ govt_inc > 0 + log2(total_inc) + ICNPO	-0.02	0.01	-1.53	0.13

Table A6

Model	log2(govt_inc) coefficient	Standard error	Test statistic	p value
volunteers > 0 ~ log2(govt_inc)	0.05	0.01	3.59	0.00
volunteers > 0 ~ log2(govt_inc) + log2(total_inc)	0.10	0.01	7.47	0.00
volunteers > 0 ~ log2(govt_inc) + ICNPO	0.01	0.01	0.73	0.47
volunteers > 0 ~ log2(govt_inc) + log2(total_inc) + ICNPO	0.03	0.02	2.03	0.04

Table A7

Model	govt_inc / total_inc coefficient	Standard error	Test statistic	p value
volunteers > 0 ~ govt_inc / total_inc	0.41	0.11	3.69	0.00
volunteers > 0 ~ govt_inc / total_inc + log2(total_inc)	0.39	0.11	3.48	0.00
volunteers > 0 ~ govt_inc / total_inc + ICNPO	-0.15	0.13	-1.15	0.25
volunteers > 0 ~ govt_inc / total_inc + log2(total_inc) + ICNPO	-0.14	0.13	-1.10	0.27